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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/816,741	04/02/2004	Mohamed K. Nezami	064750.0475	1388

45507 7590 08/15/2008

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EXAMINER	
SINGH, HIRDEPAL	

ART UNIT	PAPER NUMBER
2611	

NOTIFICATION DATE	DELIVERY MODE
08/15/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PTOmail3@bakerbotts.com
PTOmail4@bakerbotts.com

Office Action Summary	Application No.	Applicant(s)	
	10/816,741	NEZAMI, MOHAMED K.	
	Examiner	Art Unit	
	HIRDEPAL SINGH	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 June 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *20* is/are allowed.

6)☒ Claim(s) *1-8,10-17 and 19* is/are rejected.

7)☒ Claim(s) *9 and 18* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This action is in response to the amendment filed on June 11, 2008. Claims 1-20 are pending and have been considered below.

Response to Arguments

2. The clarification provided by the applicant, regarding 35 U.S.C 112 first paragraph, has resolved the issue. Therefore, the rejection under 35 U.S.C 112 is withdrawn.

3. Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-4, 7, 8, 10-13, 16-17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carleton (US 6,757,344) in view of Padovani et al. (US 2003/0063583) and further in view of Singh et al. (US 7,139,320).

Regarding Claims 1, 10 and 19:

Carleton discloses a system and method for determining frequency offset estimates (figure 2; abstract) comprising;

receiving a signal at an offset estimator, the signal conveying a plurality of symbols (abstract; column 7, lines 1-12);

taking a Fourier transform of the zero-padded signal using the Fourier transform bins to yield a transformed signal (206, 218 in figure 2; column 1, lines 60-67; column 2, lines 44-48; column 5, lines 12-25; column 6, lines 27-34);

establishing a maximum power of the transformed signal (4-2 in figure 4; column 6, lines 30-34, and 58-63; column 7, lines 42-58); and

generating a frequency offset estimate based on the maximum power of the transformed signal (column 6, lines 26-34; column 8, lines 32-41).

Carleton discloses all the subject matter as described above, except for specifically teaching that the received signal has symbols in a plurality of packets, a packet having a preamble comprising plurality of preamble symbols; and zero-padding the received signal in a time domain of the received signal with a plurality of zero-valued samples to yield a zero-padded signal, the number of the zero-valued samples calculated from a difference between the number of a plurality of Fourier transform bins and the number of the preamble symbols.

However, Padovani in the same field of endeavor discloses a system and method for high rate data transmission where received data comprise plurality of packets and a packet having a preamble comprising plurality of preamble symbols (paragraphs 0046, 0076), and Padovani further discloses, zero-padding the received signal in a time domain of the received signal with a plurality of zero-valued samples to yield a zero-padded signal (figures 4e, 4f, 4g; paragraph 0124 and 0126).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to zero-padding the signal in time domain as taught by Padovani in Carleton system for better performance as the signal is then Fast Fourier Transformed in order to obtain the increased sampling rate in frequency domain, another advantage of zero padding is to reduce the resulting Fast Fourier Transform bin width.

Singh, in the same field of endeavor discloses a system and method for channel estimation and synchronization using pilot sequences by way of zero-padding (92 in figures 4 and 10) the received signal with a plurality of zero-valued samples (column 9, lines 15-25), the number of the zero-valued samples calculated from a difference between the number of a plurality of Fourier transform bins and the number of the preamble symbols (column 3, lines 10-16; column 4, lines 35-49).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to zero-padding the received signal with zero samples as taught by Singh in the Carleton system to get zero value samples based on Fourier transform symbols and preamble or pilot symbols to achieve better frequency and phase estimation and correction in frequency domain without carrier offset and energy leakage in adjacent carriers.

Regarding Claims 2 and 11:

Carleton further discloses generating the frequency offset estimate based on the maximum power of the transformed signal by generating the frequency offset estimate as being substantially equivalent to the maximum power of the transformed signal (column 6, lines 28-34 determining the offset estimate based on greatest power of

subsamples is interpreted as the estimate is substantially equivalent to maximum power).

Regarding Claims 3 and 12:

Carleton discloses all the subject matter as described above except for specifically teaching converting the received signal to a baseband frequency using the preamble, the preamble comprising less than ten percent of the packet.

Padovani in the same field of endeavor teaches that the preamble of the signal comprises less than ten percent (3.1 percent) of the data packet (paragraph 0121).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the short preamble in the signal in order to reduce the interference and at the same time keeping the probability of false acquisition at a minimum level.

Regarding Claims 4 and 13:

Carleton further discloses establishing maximum power of the transformed signal further comprises locating a Fourier transform bin corresponding to the maximum power (4-2 in figure 4; column 6, lines 27-34; greatest maximum power of the sub-samples of sub-carriers is interpreted as max. power of FFT bin).

Regarding Claims 7 and 16:

Carleton further discloses adjusting the received signal in accordance with at least one of the frequency offset estimate, a phase offset estimate, and a residual error estimate (abstract; column 4, lines 5-10; the frequency offset compensator adjust the signal for frequency offset).

Regarding Claims 8 and 17:

Carleton discloses all the subject matter as described above and, further discloses adjusting the received signal in accordance with at least one of the frequency offset estimate, a phase offset estimate, and a residual error estimate (abstract; column 4, lines 5-10; the frequency offset compensator adjust the signal for frequency offset), and decoding/detecting the corrected signal to yield the plurality of symbols (208 in figure 2; recovered signal is interpreted to be the decoded output symbols).

6. Claims 5, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carleton (US 6,757,344) in view of Padovani et al. (US 2003/0063583) further in view of Singh et al. (US 7,139,320) as applied to claims 1 and 10 above, and further in view of Becker et al. (US 6,218,896).

Regarding Claims 5 and 14:

Carleton discloses all the subject matter as described above and, further discloses establishing maximum power of the transformed signal comprising locating a Fourier transform bin corresponding to the maximum power as above, but doesn't explicitly disclose determining a phase offset estimate from a fast Fourier transform bin corresponding to the maximum power.

However, Becker in the same field of endeavor discloses phase offset estimate from a fast Fourier transform bin or chirp z-transform corresponding to the maximum power (330-334 in figure 3; column 1, lines 15-20, 42-52; column 2, lines 7-12).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to determine the phase offset estimate from a fft bin corresponding to maximum power in order to correct the offset in the in the received signal.

7. Claims 6, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carleton (US 6,757,344) in view of Padovani et al. (US 2003/0063583) further in view of Singh et al. (US 7,139,320) as applied to claims 1, and 10 above, and further in view of Miet (US 6,499,008).

Regarding Claims 6 and 15:

Carleton discloses all the subject matter as described above except for explicitly teaching generating a decoded signal from the received signal, comparing the received signal with the decoded signal, and determining a residual error estimate in accordance with the comparison.

Miet in the same field of endeavor, teaches producing a decoded signal, comparing the decoded signal with original signal i.e. received signal to get residual error (column 2, lines 15-23).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to compare the received signal with decoded signal to get the residual error estimate in order to make the offset estimate and to correct the error.

Allowable Subject Matter

8. Claims 9 and 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. Claim 20 is allowed.

10. The following is a statement of reasons for the indication of allowable subject matter: The prior art of record Carleton et al. discloses a system and method for frequency offset estimation by zero padding the received signal in time domain based on difference of the Fourier transform bins and preamble or pilot symbols and take FFT to get frequency offset estimate from maximum power of frequency domain signal. The Prior art doesn't disclose or teach that the frequency offset estimation is further comprises a numerically controlled oscillator for receiving frequency and phase offset estimates and a residual error for adjusting received signal according to frequency, phase offset estimates and a residual error correction.

11. Other prior art references e.g. Churan (US 2004/0142660) discloses system and methods for frequency, phase offset estimation by zero padding the received signal and the taking FFT of zero padded signal (figure 23; paragraphs 0139-0140) for offset estimation based on magnitude of maximum power of signal; and Thesling et al. (US 2002/0118737) discloses system and methods in communication for frequency offset estimation where the received signal is zero padded (figure 6; paragraph 0044) and Fourier transformed to get freq. offset estimate, but theses references fails to disclose

the above mentioned claimed features, rendering them allowable if rewritten in independent form including all limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HIRDEPAL SINGH whose telephone number is (571) 270-1688. The examiner can normally be reached on Mon-Fri (Alternate Friday Off) 8:30AM-6:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on 571-272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/H. S./
Examiner, Art Unit 2611
/Shuwang Liu/
Supervisory Patent Examiner, Art Unit 2611